MS. VAN WAZER: I think there are some countervailing considerations in terms of possibly introducing consumer confusion, and issues of possibly competing unfairly with regularly licensed services, so I think there's sort of countervailing policies, some of which were addressed in our 1998 order about this.

Someone in the back of the room I noticed has a comment.

DR. BOSE: Yeah. Actually, I had two comments. One, I wanted to respond to the discussion that was just going on, which is, what happens if it expires in three years, or more to the point, how do you enforce it? And that's actually something which is contemplated and considered during the software-defined radio rulemaking process. And you probably all have bought software that's expired after a certain amount of time. You could absolutely do that in the radio, and it would stop working after three years, or you get an upgrade or a key if they've got a license to continue selling. But what I wanted to comment --

DR. LUCKY: We don't like it though.

MS. VAN WAZER: I know. I don't like it.

DR. BOSE: I understand, but if it's not selling it at all, or selling it for three years, I'll take the three years.

MR. HILLIARD: Now you're talking about price.

DR. BOSE: Right. Yeah. That's a much better discussion. What I wanted to comment on was your question about experimental licenses and new technologies, like software-defined radio, and I have a specific comment, and a general comment.

Specifically, as you know, there was a rulemaking last year on software-defined radios where you can now go through an approval process. The experimental license process, to my knowledge, has not been similarly adapted or adopted to incorporate that. And specifically, when you apply for an experimental license it is an emission designator, three letter code which is frequency, modulation and access-type basically.

Well, the whole point of a software radio is I can change all those things at any time to do different things, so I just wonder, the way we've done it so far is I basically make a list of all possible combinations of three letter designators and submit that, but it seems that there needs to

be a corresponding change to the experimental license process to, you know, the box you check off, software radio, or you have it designated as XXX if it's software radio, or something like that.

But more generally, I think this is symptomatic of something I'd like to see changed, which is it strikes me as backwards that the Commission actually adopted rules for software radio before there were rules to experiment with software radio. It would have been great if three years ago the experimental licenses had allowed software radios, more flexible radios, because those experiments would have provided data which would have actually informed the rulemaking process more than it was, so I would like to see the experimental license process be -- I think it should be the most forward-looking part of the Commission in terms of what it allows.

DR. LUCKY: Well, let me clarify that. Is this a question of people not knowing that they could have done this with experimental licenses, or is it a question of they're just not allowing it? I mean, is this --

DR. BOSE: It's a little of both. Like I said, we found a way to work around some of it by

just providing huge lists of emission designators, but there were some parts of the application that didn't permit you to do certain things that would limit your flexibility, so there's some of both in there. Especially when you talk about using different frequencies that are covered by the two different agencies represented here, which gets back to the previous point.

MR. HILLIARD: But that's another situation calling for the kind of dialogue I was talking about earlier, because the flexibility exists under the rules, I think, to do what you're suggesting should be done. I don't think it takes a change of the rules. In some cases, it may take some adjustment of policy. In other cases, it just takes a better understanding amongst different folks working at different agencies, but it's possible, at least legally it's possible. Whether it makes good sense technically on a particular frequency with a particular emission, well, that's why these folks are here.

DR. BOSE: Right. And I guess the point is that if I have to -- if I'm looking at even a small number like five different emission designators or something, in a bunch of different

bands that are going to be looked at by different agencies, that just gets unwieldy and is very -- you know, Dewayne's one year doesn't look so bad in that case, so the problem is if I'm relaxing the rules to be allowed to do different things, which is the whole point, and they have to be each evaluated on a case by case band for each band, and each adjacent thing for each emission designator, we have to back off, because like you said, technically you should be able to do that. Practically, it's very hard to get that approved.

MS. VAN WAZER: Does anyone have any comments?

MR. ROOSA: I'd like to make a small comment. I'm not sure how I could make our process applicable to your processes, but in the federal government, we often have two different kinds of approval procedures, one for the system itself, and the other for the frequency assignment. We'll send our new systems, the more what we've chosen to call major systems, will come in as sponsored by the agencies, and we'll review the proposal, and make guidances to different parts of the spectrum they might be better suited for, all sorts of things at four stages during their development. And I think

a process like that might help here, but the issues of proprietary ownership things would seem to be almost insurmountable in this kind of thing. How much can you reveal during your development phase to help spectrum management folks to provide guidances to the spectrum that you might be best suited for? That would be a difficult problem.

I know the Commission now has provisions to allow you to request that the information be held private, and I think that's good. The difficulty is how can you do a very good job of coordinating all these potential issues unless you're allowed to talk about what the spectral characteristics of the new technology are.

MR. BUCHWALD: Yeah, but that would fulfill a requirement within the United States, but when you're developing a product that's going off-shore for export, simple cellular phone, for example, where you're looking at various bands around the world that would be utilized, some of those bands do fall under the requirement that the NTIA would have to approve it. And while approval processes really do put the United States manufacturers at a disadvantage against the foreign competition that could begin testing right away, or

we have a huge cost disadvantage in that we have to go off-shore to test.

MR. ROOSA: It seems to me there's about five or six different sub-processes buried in this discussion. There's the off-shore one that he just mentioned, and that has a different set of problems. And the one where you're developing a new technology in the TV band, and another one where you're developing a new technology that fits into the spectrum. And it's hard for me to address any one of them when they seem to be hopping around so much.

We don't, ourselves, do any oversight of devices the military develops, for instance, for use overseas, other than to ensure that they have proper spectrum assets to use at the test sites. And that's another issue that makes us different.

We have test sites operated by several agencies, many agencies that allow them to do short-term testing on almost any portion of the spectrum for a 30, 60 day time period without any further review from the central authorities. I don't know whether that's practical for the private sector or not, because there are so many different laboratories that you're speaking of, I'm sure.

But it seems to me that there could be some process where you would be able to do short term testing of some of these features without oversight from the Commission.

DR. LUCKY: Now I just -- there's something I want to get out, and I don't know how to get it out. That's how aggressive are we being about the use of experimental licenses? I mean, you know, we've been talking all day about all the new technologies, all the need to pull these things along.

Have we seen -- let me ask you FCC people, have we seen any increase in the use of experimental licenses? Is it something that is really being used to its fullest? Is it something that needs to be more aggressively used?

MS. VAN WAZER: Bruce, did you want to comment on that, or do you have some --

MR. FRANCA: Well, I'll tell you. We generally have about 1,000 experiments going on at any one time. They certainly represent the kinds of things that seem to be at the forefront of the discussion. I mean, certainly software-defined radios, ultra wideband. Certainly, you know, lots and lots of broadband type applications on power

lines so, you know, I can't say whether or not they fully represent, you know, everything that could or couldn't be done, but they certainly are the topics that we seem to see, and they do seem to, in many regards, appear under Part 5 before they get to the FCC so, you know, I think it's a program that's basically being used at least by certainly -- the big radio companies certainly know it's there, and use it. And it seems to me the smaller folks, like some of the people here on the panel, like Dotcast. They certainly have been told about this, and have taken advantage of the experimental radio program.

DR. LUCKY: In the approval process, is the worth of -- the importance of the experiment weighed against the possible harm? Or is it strictly an issue of the Hippocratic oath kind of a thing, "First do no harm"?

MR. FRANCA: It's basically a non-interference -- and that brings up an issue because it seems to me -- I mean, nobody has really talked about this, but even if you're developing a new product, and say I -- that new product needs a new allocation at 10 gigahertz. You might be able to actually develop the equipment and test it at 12 gigahertz or somewhere else in the spectrum that

doesn't raise government issues, or doesn't raise some of these other things. And then pursue the political course to actually get the allocation, so there's the experiment and the development, and how frequency dependent, certainly for ultra wideband and software-defined radios, you know, those are issues that are much more frequency dependent. But there's lots of developments that are going on that probably you can do the experimentation in other places.

DR. BOSE: I would say as a user of the system, my perception is exactly what you said. It seems like the application process is proving that you're going to do no harm, and that's a fundamental issue.

MR. FRANCA: That's the rule.

DR. BOSE: Yeah, I agree. And I'm not saying that's wrong, but I --

DR. LUCKY: Maybe it is wrong.

DR. BOSE: Okay.

DR. LUCKY: Because, I mean, no harm is maybe too tough a criterion. I mean, you know, no harm is really tough. Just a little bit of harm in the social good might be a lot, you know.

DR. BOSE: If it's a little bit of harm

in a defined area for certain period of time, maybe. But I think that when you're talking about harm, the way we go about trying to evaluate harm is unnecessarily complicated at the moment. I mean, fundamentally, it comes down to in the frequencies I want, how much power am I transmitting, and how much power am I spewing outside of that band. And then I can have a pretty reasonable idea of the harm I'm doing to the other people, and we don't have to get into the details of what kind of modulation you're using, and access, and all that. I think we could streamline that process of determining, and that should be it.

MS. VAN WAZER: We had a comment in the front.

PROF. RAO: Yes. It's a process question. Who regulates the user spectrum on a Native American Indian reservation? I have heard anecdotally that it's not the FCC, but I want to hear from you.

MS. VAN WAZER: So this is related to experimental licenses? My understanding was there are some issues in terms of jurisdiction, but we do generally have -- there are agreements, and I think the general view - please correct me if I'm wrong -

is that the FCC has jurisdiction.

MR. FRANCA: I just envision the casinos and radio experiments. I don't know.

MS. VAN WAZER: Yeah, has jurisdiction under the circumstances, but please --

MR. HOARTY: Well, I would think that the fact that the radio waves that you're transmitting within the Indian Reservation wouldn't stop at the border. It would probably mean it would have impact on -- the FCC would certainly have to have a say.

PROF. RAO: But what if it did, if it was sufficiently short distance?

MS. VAN WAZER: I really don't know that we're the panel to speak to that issue. If there's someone else who'd like to comment on it, there's someone in the back of the room had a comment?

MR. FRANCA: Actually, I wanted to add a comment that was sort of a follow-up to what Vanu was talking about, asking for a streamlined process, and determining what causes harm or not. I think there's a real critical question, and I think this is, perhaps, what tomorrow is about. But the critical question I see is, who gets to decide what is considered to be harm? Is it the

incumbent or the existing licensee of the piece of spectrum? If they say it's harm, does that mean it's harm? Or is it the FCC that gets to decide what would be harm? It would be -- you know, is it what would harm a receiver that had been designed, taking all reasonable steps to make that receiver robust against other kinds of things?

There's a very wide range. I actually explained it once. There's, you know, more -- I was able to explain that there's more than a 90 dB range that people could reasonably have in mind as to where the level of harm or interference shows up.

MR. FRANCA: And generally in that case, we'd basically let the experiment go forward. And if we got complaints, or we'd maybe ask you to monitor, you know, or talk to a particular user in the area. And then, you know, if there was a real dispute you'd come back to us between the parties, so I mean, generally we don't say no. We basically say that's your obligation, as to cause no harm. Go out and go do it. It might mean, you know, operating from 2:00 in the morning to 5:00, or kind of just have an agreement. Or it might be basically we're going to operate at this lower

power level. We're going to have some test receivers out there. If we get a complaint, you know, then you have to shut down.

MR. HOARTY: That was certainly the case with us. We were -- I was up many a night in the wee hours of the morning when we first started with our STA, and moving beyond our experimental.

AUDIENCE MEMBER: Thank you. I think that's a good answer in the context of experimental licenses. And I guess there's the whole issue of underlay, which is probably best left for tomorrow.

MS. VAN WAZER: We certainly will address some of those issues tomorrow at the interference protection workshop.

I'd like each of the panelists - we're just about running out of time here. I'd like each of the panelists to give one final remark on what positive experiences and what's positive, in terms of the experimental licensing program, and very briefly, where you seem room for improvement. We have five minutes for the entire panel, so keep that in mind.

MR. SOLOMON: Well, I think the simple answer is that some applications have gone through flawlessly. The staff has been great to work with,

and there haven't been any problems. And on the other hand, as we said here today, sometimes applications just get lost somewhere in the recesses of somewhere, and it's hard to get it out, or hard to understand what the status of the application is. And that's particularly disturbing in the business environment when time is critical, and you must rush to market to beat your competitor, so that can be very disconcerting.

MS. VAN WAZER: Thank you.

MR. ROOSA: One of the things that strikes me is there seems to be a lot of difficulties in the process in an area that I might call frictional time losses between different pieces and steps in the procedure. And I think that's something that NTIA and FCC ought to work together to resolve as much as we can. They give us a document. We look at it for 15 business days and get it back, and somewhere it gets stuck. We need to determine where that somewhere is, and figure out how to solve that problem.

MS. VAN WAZER: Is there anything good about that?

MR. LYNCH: I've got some pretty good experience with it. I've got a nationwide

experimental. We had to coordinate it and all that, but it was an idea that actually came out of somebody in OET when we were trying to roll out a network called Sprint, and it worked quite well for us. And I probably have 800 megahertz to about 30 gigahertz on that license. That's all things that conform to the U.S. allocation table. And again, for non-conforming things, it would be nice to have a method, or be sure that's being done in a timely manner.

And the other thing is, if it's going to -- if somebody's got a problem with it, say DOD. They never have problems, but if DOD has a problem with it, let's convene a small group and sit down and discuss what is the problem as we find our way around this process.

MR. ROOSA: That's certainly an agreeable way to do things for us. I don't know if it's always easy to get the people together, but we certainly are available for that.

MS. VAN WAZER: Well, we've gotten together here. Leo, would you have something?

MR. HOARTY: Thank you. As I mentioned at the opening, I spent a good part of the last year coming to Washington, meeting with the OET and

met with the R&D Labs up in Laurel and, of course, Mass Media, now Media Bureau. And the Commission, in general, was terrifically helpful, and I thought especially for a part of our government, I was pleasantly surprised at how much support I got, and guidance. Especially the tricky issue we've been discussing for the last few minutes, or the last 15 minutes of what is interference, and how do you deal with, when you're in the midst of people operating and making money, and you come along with something new? And I think the Commission has been very good at trying to find a happy medium, even though it meant being up at 2 in the morning experimenting.

The only thing I'd like to close with is venture-funded start-up timing is absolutely everything, especially today. I mean, cash in the bank is our life blood until we get to market, and that's the only comment I would have, is timing is absolutely critical to new technology.

MS. VAN WAZER: Thank you.

MR. HILLIARD: Well, I, too, have had a lot of good experiences, but there's no substitute for trying to share ideas and have that discussion before something unusual comes down the pike and

enters into the formal process.

And speaking of that, I think, as a reform step or an improvement step that would not require a change in the rules, it would be useful to convey more knowledge into industry about the experimental radio service, from both nuts and bolts to the policy side of it, so that you would have greater assurances in some situations where you're dealing with unusual experimental requests, the DC-to- light situation, for example. That those folks that are managing those operations do have an enhanced sensitivity to the problems that they could cause, and they have in place steps to prevent those.

MS. VAN WAZER: Thank you.

MR. FRANCA: I don't think I'm going to answer your question, but I did want to --

MS. VAN WAZER: I hope you say that the staff does a good job, Bruce, because I work for you.

MR. FRANCA: I do want to thank every -- you know, like Dewayne, Benn and Vanu, and David, and Ben for really, I think, some good suggestions that I think we need to take a look at in trying to make this process better.

I do want to reiterate, you know, our goal is really to say yes to every one of these experiments that come on. That's really what we want to do.

MS. VAN WAZER: Thank you.

MR. BUCHWALD: And I'd like to just state that at least over the last three to four years, the experimental process has really been streamlined, and has worked well when it comes to spectrum that's not government spectrum.

When you get into, again, things that you're developing for some markets that are for export, that's where the difficulties come in. And if we could find a place to pour the grease in so that the 15 days it takes to get through the NTIA, if that's what it takes, and then that extra time that seems to add up to a year in-between the approval can get sped up, that would really help a lot.

MS. VAN WAZER: Well, thank you. Thank you, panelists, and thank you, audience. Thank you for your suggestions.

(Whereupon, the proceedings went off the record 3:05 p.m.)